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Notice of Allowability	Application No.	Applicant(s)	
	10/807,081	CHEN ET AL.	
	Examiner	Art Unit	
	Asok K. Sarkar	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 1/9/2006.
2. ☒ The allowed claim(s) is/are 1-18,20-25,27,28 and 30-32.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Response to Arguments

1. Applicant's explanation of the instant invention in pointing the difference with the cited prior art was found to be persuasive.

Election/Restrictions

2. Claims 1 – 14 are directed to an allowable process. Pursuant to the procedures set forth in the Official Gazette notice dated March 26, 1996 (1184 O.G. 86), claims 15 – 18, 20 – 25, 27, 28 and 30 – 32, directed to the process of making or using the patentable product, previously withdrawn from consideration as a result of a restriction requirement, are now subject to being rejoined. Claims 15 – 18, 20 – 25, 27, 28 and 30 – 32 are hereby rejoined and fully examined for patentability under 37 CFR 1.104.

Since all claims previously withdrawn from consideration under 37 CFR 1.142 have been rejoined, the restriction requirement made in the Office action mailed on August 11, 2005 is hereby withdrawn.

Allowable Subject Matter

3. Claims 1 – 18, 20 – 25, 27, 28 and 30 – 32 are now allowed.
4. The following is an examiner's statement of reasons for allowance:

Claims 1 – 14 and 30 – 32 recite, inter alia, a method of reducing boron segregation phenomena in an N channel, metal oxide semiconductor (NMOS) device via formation of a doped insulator region formed in an underlying insulator layer, comprising the steps of forming a semiconductor layer on an underlying insulator layer, wherein said insulator overlays a semiconductor substrate, forming a hard mask layer

on said semiconductor layer, defining openings in said hard mask layer and in said semiconductor layer exposing a portion of said insulator layer and creating composite stacks comprised of hard mask shapes on semiconductor shapes, laterally removing portions of said hard mask shapes exposing top portions of edges of said semiconductor shapes, performing an ion implantation procedure to place ions in portions of said insulator layer exposed in said openings, and to place ions in portions of said insulator layer underlying portions of said semiconductor shapes, performing an anneal procedure to activate said ions and forming said doped insulator region in portions of said insulator layer, filling said openings with a second insulator layer and removing said hard mask shapes. The art of record does not disclose or anticipate the above limitation in combination with other claim elements nor would it be obvious to modify the art of record so as to form a device including the above limitation.

Claims 15 – 18, 20 – 25, 27 and 28 recite, inter alia, a method of reducing a boron segregation phenomena in an N channel, metal oxide semiconductor (NMOS) device via formation of doped insulator regions in an underlying insulator layer and via formation of a dielectric barrier layer surrounding insulator filled shallow trench shapes, comprising the steps of forming a silicon on insulator (SOI) layer wherein an insulator component of said SOI layer is comprised of silicon oxide, located on a semiconductor substrate, forming a silicon nitride layer on said silicon layer, performing an anisotropic dry etch procedure to form shallow trench isolation (STI) openings in said silicon nitride layer and in said silicon layer exposing a portion of said insulator layer, with unetched portions resulting in composite stacks comprised of silicon nitride shapes on silicon

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shapes, performing an isotropic etch procedure to laterally remove portions of said silicon nitride shapes exposing edges of top portions of said silicon shapes, performing an ion implantation procedure to place ions in portions of said insulator layer exposed in said STI openings and to place ions in portions of said insulator layer underlying portions of said silicon shapes, performing a hydrogen anneal procedure to activate said ions and to form said doped insulator region in portions of said insulator layer, forming said dielectric barrier layer on exposed surfaces of said STI openings and on portions of said insulator layer exposed at bottom of said STI openings, depositing a silicon oxide layer completely filling said STI openings, performing a planarization procedure to form silicon oxide filled STI regions and removing said silicon nitride shapes. The art of record does not disclose or anticipate the above limitation in combination with other claim elements nor would it be obvious to modify the art of record so as to form a device including the above limitation.

Conclusion

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 571 272 1970. The examiner can normally be reached on Monday - Friday (8 AM- 5 PM).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on 571 272 1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Asok K. Sarkar
January 19, 2006

Primary Examiner